GE
Security

Alliance Control Panel

Installation Manual

Models: AL-2017

AL-3017

Contents

Introduction

This manual covers the information needed to install and set up the Alliance AL-2017/AL-3017 control panels including system wiring and basic programming steps. See the *Alliance System Programming Manual* for complete planning and programming details for the Alliance system, including a programming map and a system glossary.

Planning the system

It is important to create a comprehensive system plan prior to installing the Alliance system. This plan should include a site map, a component and equipment list, a zone list, a type list, an area list, a region list and the number of users.

Memory expansion options for the AL-3017 (AL-2017 does not support memory expansion)

AL-1830 memory expansion is a special option installed into the AL-3017 control panel to increase the memory capacity as detailed below:

		AL-1830 1M memory expansion
Users	50	11,466
Door Groups	10	128
Floor Groups	10	64
History:		
Alarm System Events	100	1,000
Access Control Events	100	1,000

Installation

Each Alliance system control panel is shipped with the following hardware:

- Two and three position terminal blocks that can be combined to provide a variety of terminal block configurations
- Clip-in and screw-in male/female standoffs
- Mounting screws
- Battery wires

⚠️ **CAUTION** **You must be free of static electricity before handling circuit boards. Wear a grounding strap or touch a bare metal surface to discharge static electricity.**

To install the controller, do the following:

1. Mount the enclosure

A suitable mounting location should include easy access for wiring, good lighting, suitable access to power and earth ground, and ample space to work. The mounting surface should be flat and dry. We do not recommend mounting metal enclosures directly onto concrete walls. Check with local authorities to verify local codes regarding metal enclosure mounting.

> **Note**: *To maintain compliance with UL 365, UL 690, and UL 1610, the main control panel must be installed within a safe, vault, or Extent #1 stockroom.*

All of the Alliance System enclosures contain four mounting holes located in the corners of the enclosures. Use appropriate mounting hardware to mount the enclosure to the mounting surface and the batteries to the enclosure as shown in Figure 2.

2. Install the standoffs

Before the control panel can be installed, the appropriate standoffs must be configured. Use male/female standoffs where threaded holes are aligned with the mounting holes on the control panel and use clip-in standoffs where square holes are aligned with the mounting holes (Figure 3).

3. Install the transformer

Mount the transformer in the enclosure using two 6/32 x 1/4" screws provided with the transformer. Install the rubber grommet into the transformer shield and mount it to the enclosure using four 6/32 x 1/4" screws provided with the transformer.

4. Earth/chassis ground standoffs

It is important that proper grounding is provided to the enclosure. Use two male/female standoffs provided with the enclosure to secure both the earth ground and enclosure ground wires. When securing the ground wires, use the internal tooth star washers provided with the enclosure between the standoff and the wire connector. All connections should be tight and make a good electrical connection.

5. Install the tamper switch

Assemble the tamper switch assembly per the instructions provided with the tamper switch. Mount the switch assembly using the three 6/32 x 1/4" screws provided.

6. Install the control panel board

Slide the terminal blocks together as shown in Figure 1. Slide the blocks over the appropriate pins indicated on the board. Mount the board using four 6/32 x 1/4" screws along with internal star washers. To ensure proper ground, tighten screws securely. See Figure 3 for proper mounting orientation.

Figure 1. Terminal blocks
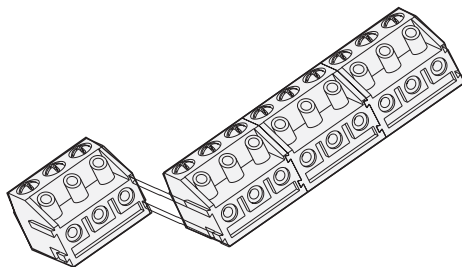
7. Ferrites

To be compliant with FCC Part 15B, ferrites must be installed on each of the AC wires (Figure 2). Refer to the instructions provided with the ferrites for mounting details.

Figure 2. Enclosure

Enclosure mounting screws

PSTN (Public Switched Telephone Network)

Ferrites

AL-2017/ AL-3017 Board

Chassis ground connection

Optional accessory boards

Chassis ground

Earth ground connection

Tamper switch access hole

12 V battery, refer to *Battery calculation worksheet* for appropriate battery type.

120 VAC

Enclosure mounting screw

24 VAC, 100VA

Enclosure mounting screw

Figure 3. Layout diagrams

AL-2017/ AL-3017 mounting holes

Optional board mounting holes

AL-2017/ AL-3017

Optional boards

AL-2017/ AL-3017

Optional boards
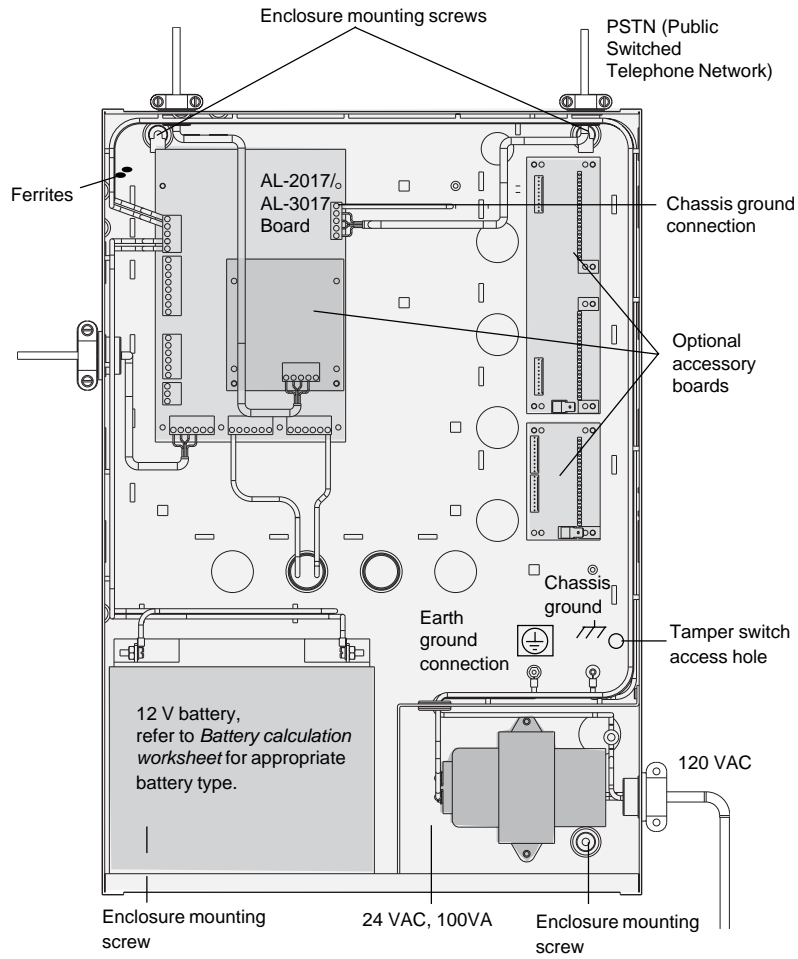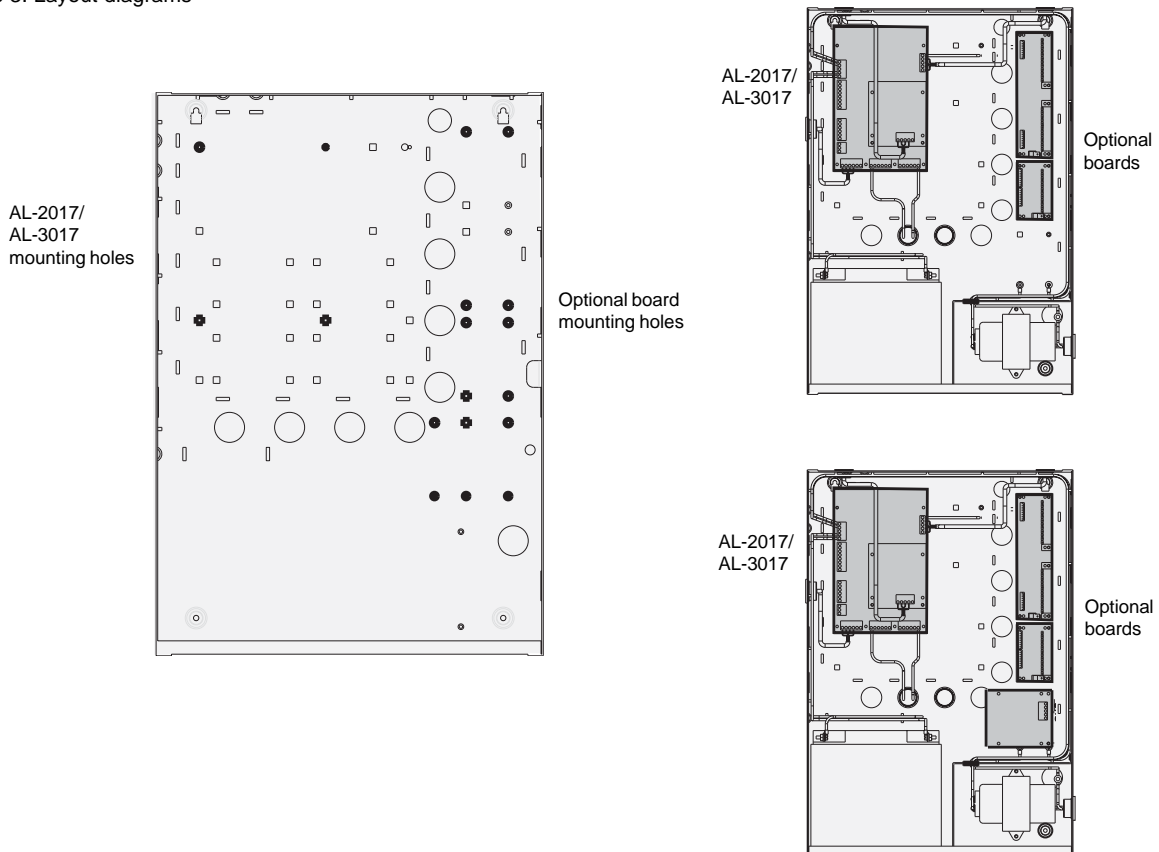
System Wiring

All panel wiring should be kept well away from other wiring, avoiding parallel wire runs with other wires. Where parallel wires are unavoidable, keep wires a minimum of 2 inches apart, or in EMT. We recommend that Alliance system components that use direct wire transformers be wired into a dedicated circuit breaker and those that use plug-in transformers be plugged into an unswitched outlet.

Earth ground

⚠️ **WARNING Each control panel or device which mounts in a metal enclosure, must have its enclosure connected to earth ground. Correct earth grounding procedure must be followed.**

Earth grounding one enclosure containing several devices

All devices designed for the system have chassis ground connections via metal studs to the metal enclosure. Take care that these metal studs make good connection to the enclosure (beware of paint). The earth connections of every piece of equipment in the system can be used for connecting the shielding of shielded cables. If a device, such as a keypad, is placed in a plastic enclosure the earth lug of this device does not have to be connected.

Earth grounding panels in a single building

If several enclosures or devices are connected to earth ground in one building, the safety earth ground of this building has to be checked by a licensed contractor.

Earth grounding panels in multiple buildings

If the wiring extends to separated buildings, more than one common earth ground system will be used. Use isolater/repeaters to isolate the system bus. In this way the system is protected against variations in earth potential.

System bus connection

The system bus (COMMS) is used to connect data gathering panels (DGP) to provide extra zones, and remote arming stations (RAS) to the Alliance system control panel. Remote devices can be up to 5,000 feet (1.5 km) from an Alliance system control panel. DGP and RAS devices must be connected via a 2-pair twisted, shielded data cable from the system bus connection (Belden 8723 is recommended). The shield of the data cable should be connected to earth at the Alliance system control panel and should be left disconnected at any other end. We recommend that where the distance between the arming station and the nearest device is more than 328 feet (100 meters), a separate power supply be used to power the arming station. To power the arming station, **do not** connect '+' from the system bus. Connect '+' of the local power supply to '+' on the arming station and connect 0 volts from the power supply **and** 0 volts from the system bus to the arming station terminal marked '-'.

> **Note:** *The first and last devices on the system bus must be terminated. All other devices on the system bus must not be terminated.*

Figure 4. System bus connection
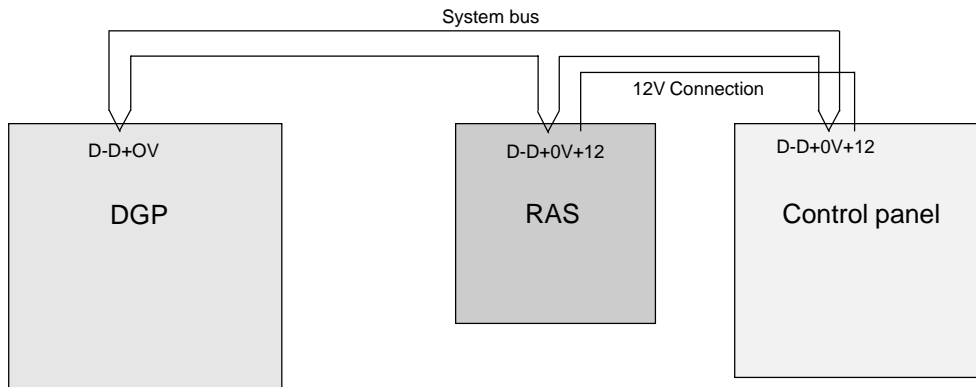
Shielded cable routing

The shielding of all shielded cables used in the system should only be connected at ONE side to one common earthing point in a building. If a shielded bus cable is routed via more than one plastic device, the shielding from incoming and out-going cable has to be connected.

> **Note:** *Metal chassis must be earth grounded. Splice shield drain wire at all juntions.*

Figure 5. Shielded cable routing
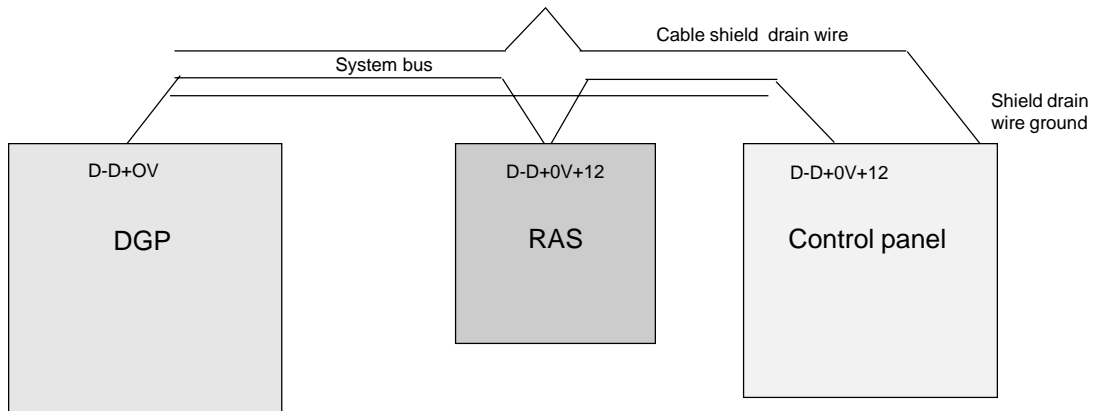
Auxiliary power supply connections

In systems in which expansion module power is not supplied by the main control panel or an AC-powered DGP with auxiliary outputs, a UL Listed power supply suitable for burglar alarm applications, such as the Altronix AL300ULX, must be utilized.

> **Note:** *Tie all 0V together. Do not connect the +12V together.*

Figure 6. Auxiliary power supply connections
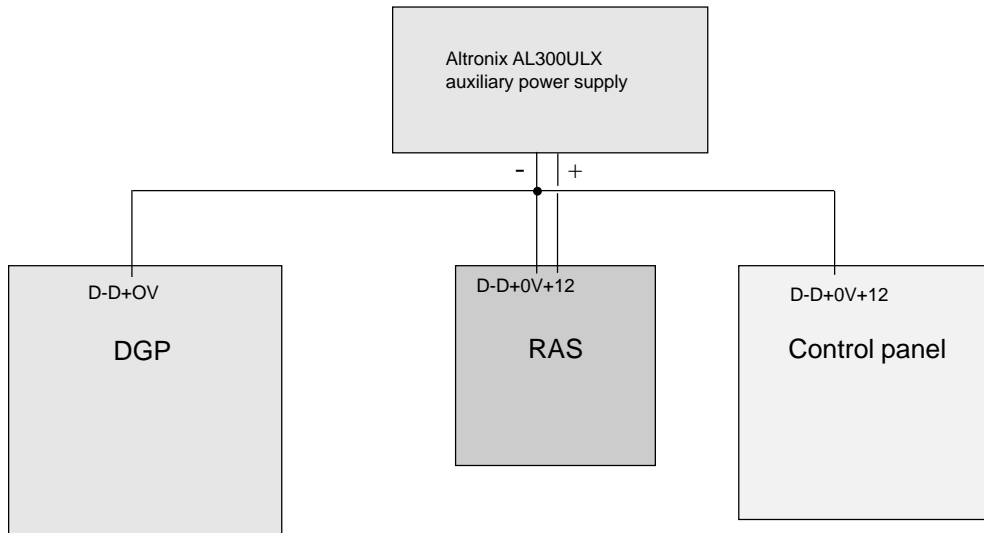
PSTN wiring

Figure 7 shows how to wire the control panel to PSTN connection. This equipment complies with FCC Part 68 rules. US: GEIAL07B3-4000

Note: *We recommend that the system be wired to a dedicated PSTN line.*

Figure 7. PSTN Wiring Diagram

Note: *A - To Pin 5 on RJ45 Cable*
B - To Pin 4 on RJ45 Cable
AX - To Pin 1 on RJ45 Cable
BX - To Pin 8 on RJ45 Cable
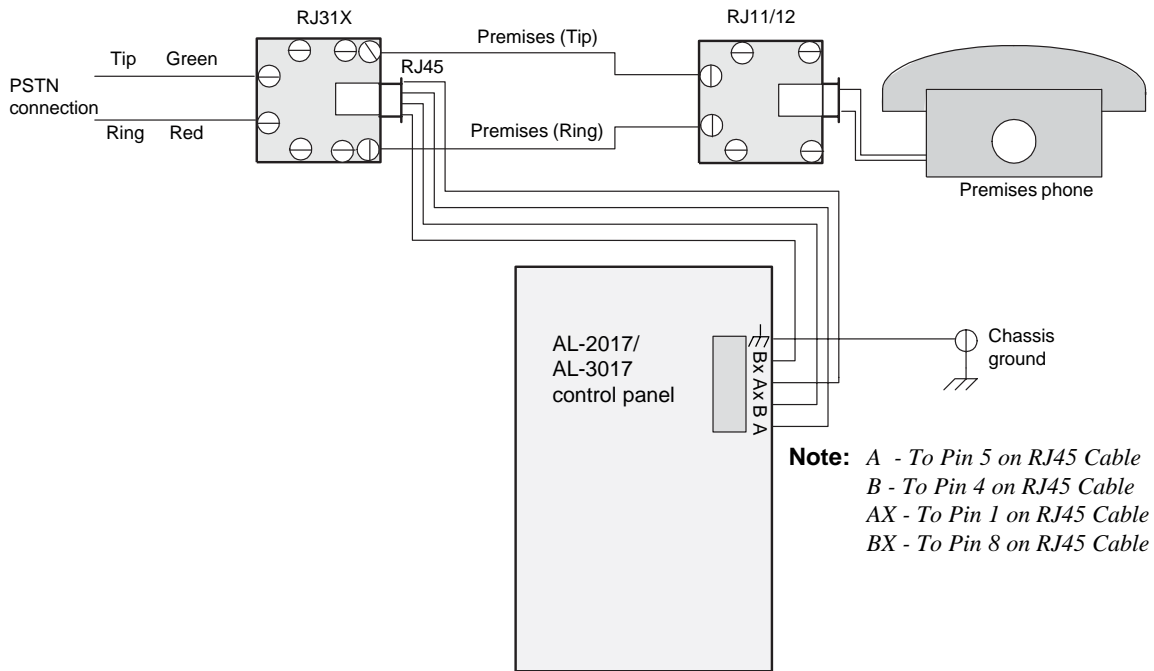
AL-2017/AL-3017 Wiring

Keep non-power limited wiring away (1/4" minimum) from power limited wiring as shown in Figure 8. Disconnect the AC mains power via a dedicated circuit breaker before servicing.

Figure 8. Non-power and power limited wiring
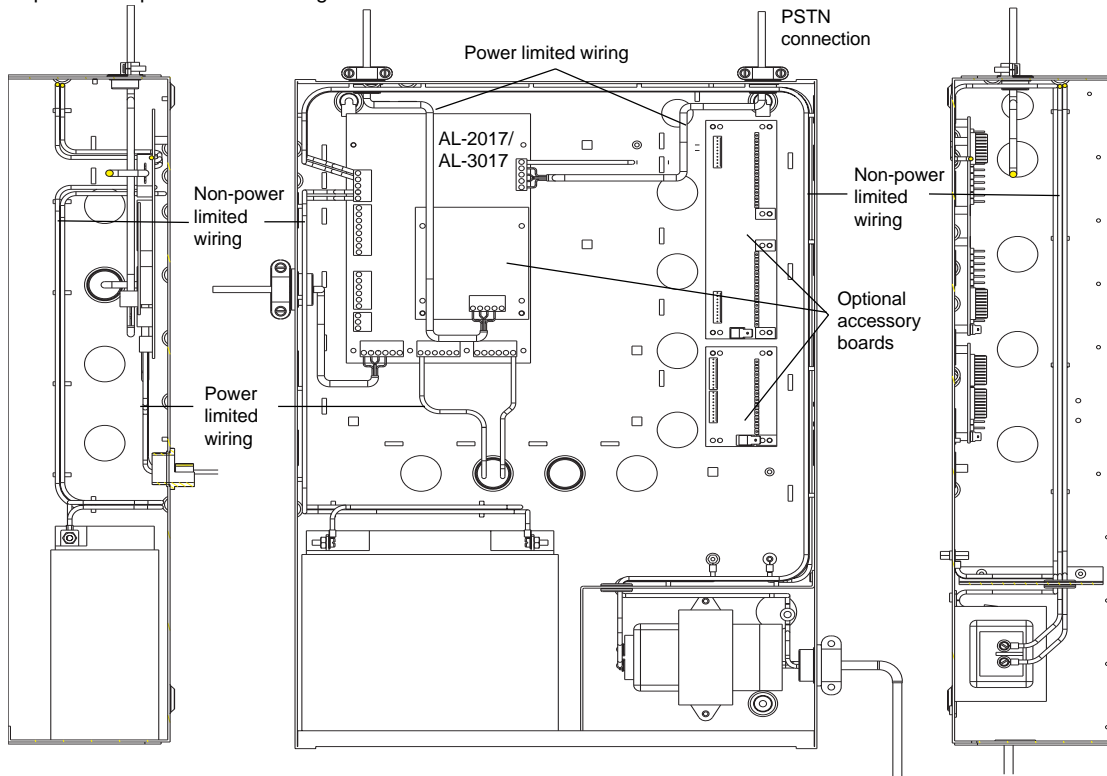
Control panel wiring connections

Figure 9 shows the AL-2017/AL-3017 control panel components and Figures 10 and 11 provide wiring connection details.

Figure 9. AL-2017/AL-3017 control panel components
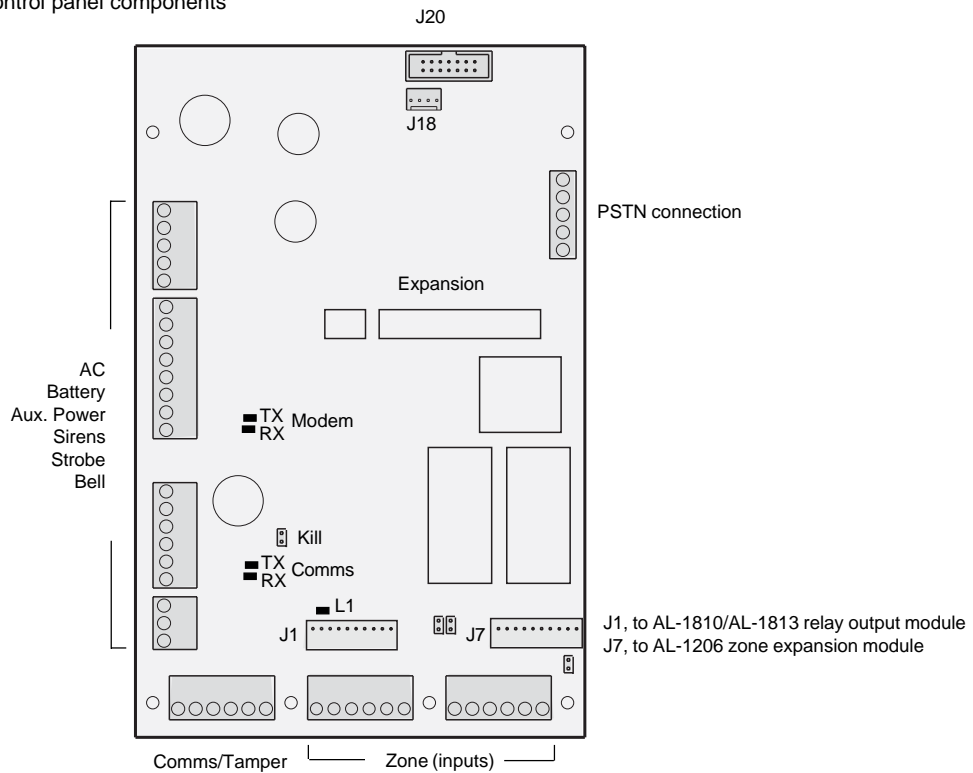
Figure 10. AL-2017/AL-3017 control panel wiring connections

24 VAC, AL-1290 transformer kit

≈
≈ AC

+ ⏚

+
− BATT

+
+
+
−
−
− AUX. POWER
SW +
SW −

Ademco *
AB12M

S + EXT
S −
S + INT
S −
+ STRB
−

8 ohm 15 watt
MPI - 35 or EQ
Strobe
1K

NEG
C BELL (relay output)
POS
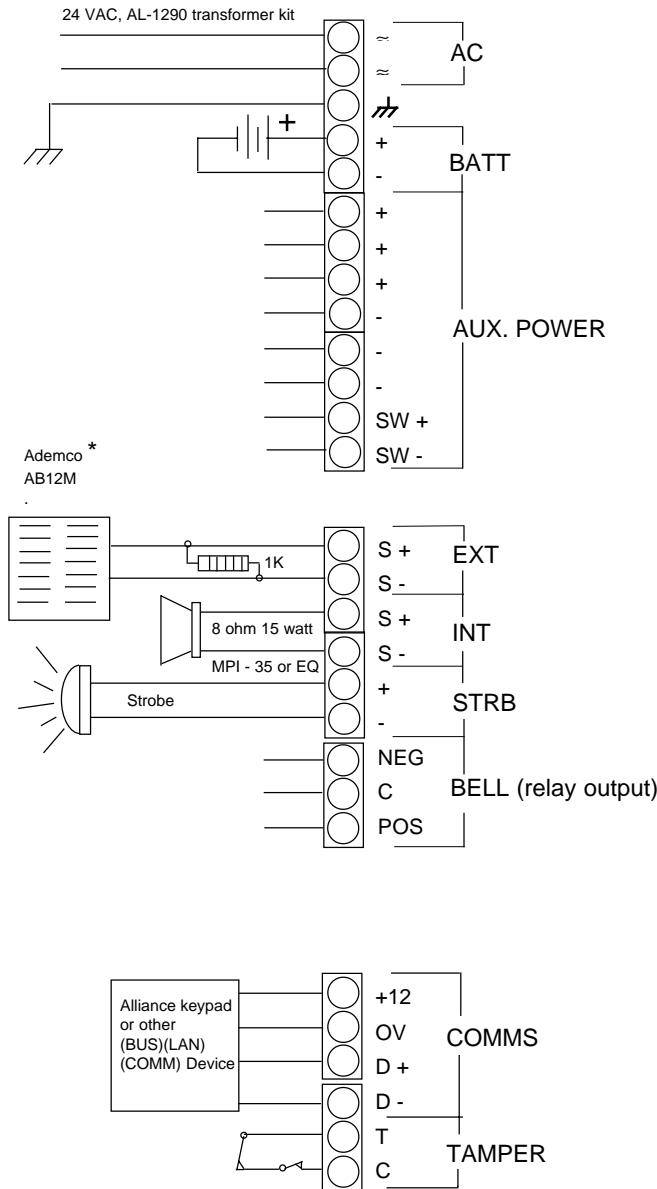
Note: *Do not short circuit. Use ferrites on AC input wires.*

Note: *Refer to Battery Calculation Worksheet for appropriate battery type.*

Note: *Total AUX POWER output 300mA, including +12 on COMMS.*

Note: *No switched auxiliary output for the AL-2017.*

Note: *Alarm output 1 Amp total.*
* Siren output must be programmed for DC output if a bell is connected to these terminals instead.
A 1k resistor must be installed across the external siren outputs.

Note: *These are dry contacts.*
NEG = NC
POS = NO

Alliance keypad or other (BUS)(LAN) (COMM) Device

+12
OV COMMS
D +
D −
T TAMPER
C

Note: *The first and last device on the system bus (COMMS) must be terminated.*

Figure 11. Zone (inputs) wiring methods

1 C 2 3 C 4   5 C 6 7 C 8

Zones (inputs)

Method 1
single zone

Zone input   C

4.7K
NC
Open = Alarm or Trouble

4.7K

NO
Closed = Alarm

Method 2
dual zone

Zone input   C

NO
Closed = Tamper

4.7K
NC
Open = Tamper or Trouble

4.7K

NC
Open = Alarm
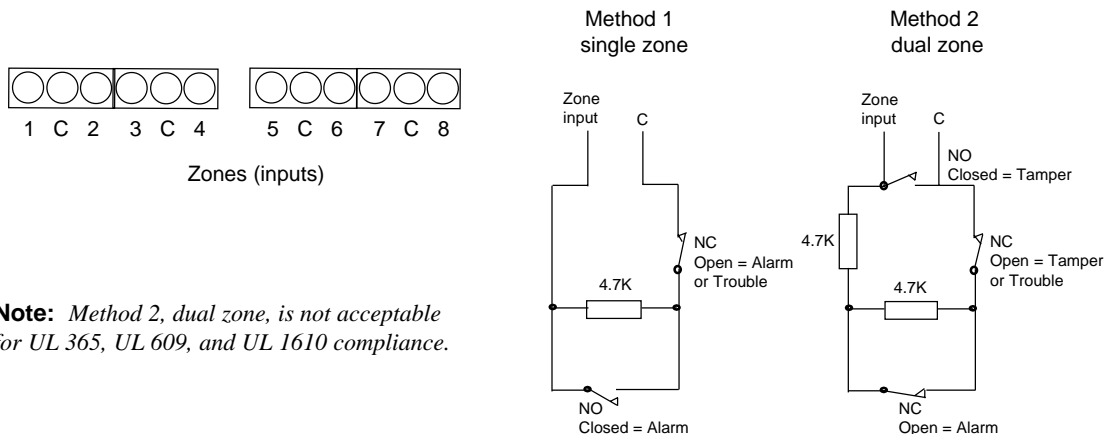
Note: *Method 2, dual zone, is not acceptable for UL 365, UL 609, and UL 1610 compliance.*

Basic Programming

When you have finished installing the control panel, you can clear the panel memory, apply power and start programming.

Clear panel memory

Before programming, the panel memory needs to be cleared. To clear the memory, do the following:

1. Remove all power to the panel (AC and battery).

2. Short the *KILL* jumper (Figure 9).

3. Wait 30 seconds.

4. Open the *KILL* jumper.

The panel memory is now cleared and restored to factory defaults.

Power up the panel

On initial power-up, the panel's LEDs (Figure 9) should indicate:

L1	Slow flashing (micro processer is running)
Comms Tx	Rapid flashing (Comms bus activity)
Comms Rx	Rapid flashing (if RAS 1 is connected and functioning)

The master LCD arming station (RAS 1) should have all area LEDs lit (armed). After the RAS prompt, press **MENU**, then press **CLEAR**. If there is a system condition (such as low battery), it will be indicated on the top line of the RAS display.

If the master RAS powers up, but no LEDs lit (on) and there is not LCD display, then no power has been applied to the RAS. If the RAS powers up with all LEDs flashing and the display shows *System Fault*, then the system bus cabling may be faulty, or the RAS address has been incorrectly set (RAS 1 address should be all DIP switches set to OFF).

Access programming menus

To disarm the system, enter **1122** (the default Manager PIN code), press **OFF**, and enter **0** (select all areas).

```
00:00 01/01/2003
Code:
```

To enter the system menu, press **MENU**, enter **1278** (default Installer PIN), and press **ENTER**.

```
0-Exit ENTER-Down, *Up
0-Exit, Menu:
```

To access installer programming, enter **19** (installer programming menu), and press **ENTER**.

```
Simple/Advanced Menu
*-Advanced
```

To choose the advanced menu option, press **MENU**. To choose the simple menu option, press **ENTER**.

```
Installer Programming
0-Exit, Menu:
```

> **Note:** *The simple menu option will limit access to a number of options in the Installer Programming Menu. We recommend that you always choose the advanced menu option.*

Default the panel

This option resets all programming to the factory default. All programming will be erased and all options will have the standard values. To default the panel, do the following:

1. Press **MENU**, enter **1278**, and press **ENTER** to access the system menu.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **14** and press **ENTER** to access the default option.
4. Enter **99** and press **ENTER**.

The panel is now defaulted.

Change the time/date settings

To set the time and date, do the following:

1. Disarm the system.
2. Press **MENU**, enter **1278**, and press **ENTER** to access the System menu.
3. Enter **15** and press **ENTER** to access the time and date menu.
4. Enter **2** and press **ENTER** to set the time and date.
5. Enter the hour and press **ENTER.**
   > **Note:** *The Alliance System uses a 24-hour format. For example, noon would be entered as 12 and midnight would be entered as 24.*
6. Enter the minutes and press **ENTER**.
7. Enter the seconds and press **ENTER**.
8. Enter the day of the month and press **ENTER**.
9. Enter the month and press **ENTER.**
10. Enter the year (last two digits) and press **ENTER**.

For further details on time and date setting options, see the *Alliance System User's Guide.*

Installer programming menu

See the *Alliance System Programming Manual* for a complete programming map.

1. Zone database
2. Area database
3. RAS database
4. DGP database
5. Alarm groups
6. Timers
7. System options
8. Auto reset
9. Communication options
10. Program text
11. Version number
12. LED test
13. Time zones
14. Reset to default
15. Alarm group restrictions
16. Event to outputs
17. Auto arm/disarm
18. Areas assign to vaults
19. Area linking
20. System codes
21. Zone shunts
22. Time zone to follow output
23. Poll errors
24. Download to remote devices
25. Display card
26. Reserved menu
27. Reserved menu
28. To remote devices
29. Computer connection
30. Printer
31. Battery testing
32. Custom LCD message
33. Program next service
34. Program system event flags
35. Program macro logic
36. Reserved menu
37. Reserved menu
38. Reserved menu
39. Reserved menu
40. Reserved menu
41. Reserved menu
42. Reporting class database
43. Test calls
44. Reserved menu
45. Reserved menu
46. Reserved menu
47. Reserved menu
48. Reserved menu
49. Class database
50. Channel mapping
51. Engineer reset
52. Voice reporting

Programming Steps

The following programming steps are meant as an overview. For more information on each programming area, see the *Alliance System Programming Manual.*

Text words

Program any needed text words that are not included in the word library. See the *Alliance System Programming Manual* to view the word library.

1. Press **MENU**, enter **1278**, and press **ENTER** to access the system menu.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **10** and press **ENTER** to access program text.
4. Enter the text word number (custom text word numbers start at 900) and press **ENTER**.
5. Using the number keys, enter the required letter. Press the **ENTER** key to advance to the next letter. Press the **MENU** to advance to the next word. Press the **CLEAR** key to exit this menu option.

Time zones

Program time zones to allow certain automatic functions, such as *Auto Arm* or only allow certain users access during predetermined time periods.

1. Press **MENU**, enter **1278**, and press **ENTER** to access the system menu.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **13** and press **ENTER** to access time zone programming.
4. Enter the time zone number and press **ENTER**.
5. Enter the start time hour and press **ENTER**.
6. Enter the start time minute and press **ENTER**.
7. Enter the end time hour and press **ENTER**.
8. Enter the end time minute and press **ENTER**. The start and end times will display on the top line of the keypad display.
9. Press **ENTER** to advance to the day field.
10. Enter 1 through 7 (Sunday through Saturday) or 8 (holiday) for each day needed for this time zone and press **ENTER.**

Repeat steps 5 through 10 for each access time needed for this time zone (four available).

Areas

Program areas to configure individual areas, or partitions, as autonomous systems, or as parts of a single larger system.

1. Press **MENU,** enter **1278,** and press **ENTER** to access the system menu.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **2** and press **ENTER** to access the area database programming.
4. Enter the number of the area to be configured and press **ENTER**.
5. Program the area name numeric code by selecting one of the default names from the word library or from text words added in text word programming and press **ENTER**.
6. Enter the exit time for this area and press **ENTER.**
7. Enter the entry time for this area and press **ENTER**.
8. Enter the event flags and press **[ENTER]**.
9. Enter the out-of-hours time zone, if required, and press **ENTER**.
10. Enter the area disarmed time (used in conjuction with the alarm group restriction) and press **ENTER.**
11. Select the central station the area will report to and press **ENTER**.
12. Select audio listen-in, if required, and press **ENTER**.
13. Select exit fault report, if required, and press **ENTER**.
14. Select A & B alarm verification reporting, if required, and press **ENTER**.
15. Select disable arming if all inputs are bypassed, if required, and press **ENTER**.

Repeat steps 1 through 12 for all areas in the system.

Alarm groups

1. Press **MENU,** enter **1278,** and press **ENTER** to access the system programming.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **5** and press **ENTER** to access alarm group programmaning.
4. Enter the alarm group number to be programmed and press **ENTER**.

> **Note:** *Care should be taken when programming this function because it can be linked to users, doors, and remote arming stations. A review of alarm groups in the Alliance System Programming Manual is advised before programming this feature.*

Remote arming stations (RAS)

Program RAS to establish communication (polling) with the main control panel. Before a RAS can be programmed, it must be installed and the DIP switch address on the RAS must be set as shown in the RAS installation instructions.

1. Press **MENU,** enter **1278,** and press **ENTER** to access system programming.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **3** and press **ENTER** to access RAS database programming.
4. Enter the address number of the first RAS to be polled and press **ENTER**. Repeat for all RAS to be polled and press **ENTER** again after all RAS have been polled.
5. Enter the address number of the first RAS to be configured and press **ENTER**.
6. Enter the alarm group number for the RAS and press **ENTER**.
7. Enter the menu alarm group number for the RAS and press **ENTER**.
8. Enter the door event flag for the RAS, if required, and press **ENTER**.
9. Enter the output controller assignment for the RAS and press **ENTER**.
10. Select Yes, if polling an LCD keypad, and press **ENTER**.
11. Select Yes, if toggles area status is required, and press **ENTER**.
12. Select Yes, if enter key opens door only is required, and press **ENTER**.
13. Select Yes, if door event flag on alarm code is required, and press **ENTER.**
14. Select Yes, if display shunted zone on LCD is required, and press **ENTER**.
15. Select Yes, if arm/disarm using one key is required, and press **ENTER.**
16. Select Yes, if card auto disarm is required, and press **ENTER**.
17. Select Yes, if card always arms/disarms is required, and press **ENTER**.
18. Select Yes, if reset from RAS without code is required, and press **ENTER**.
19. Select Yes, if alarm group restrictions to disarm only is required, and press **ENTER.**
20. Select Yes, if entry/exit buzzers is required, and press **ENTER.**
21. Select Yes, if time lockout is required, and press **ENTER.**
22. Select Yes, if cards arm after 3 badges is required, and press **ENTER.**

Repeat steps 4 through 21 for each RAS to be configured.

Data gathering panels (DGP)

Program DGPs to establish communication (polling) with the main control panel. Before a DGP can be programmed, the DGP must be installed and the DIP switch address on the DGP must be set as shown in the DGP installation instructions.

1. Press **MENU,** enter **1278,** and press **Enter** to access system programming.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **4** and press **ENTER** to access DGP programming.
4. Enter the address number of the first DGP to be polled and press **ENTER**. Repeat for all DGP to be polled and press **ENTER** again when all DGP have been polled.
5. Enter the address number of the first DGP to be configured and press **ENTER**.
6. Enter **0** for standard DGP, **1** for a 4-door controller DGP, or 2 for a 4-elevator controller DGP and press **ENTER**.

    Repeat steps 4 and 5 for all DGP to be configured.

Zones (inputs)

Program zones to determine how the zone will function in given circumstances. There are over 50 types of zones. Refer to the *Alliance System Programming Manual* for more detailed information.

1. Press **MENU,** enter **1278,** and press **ENTER** to access system programming.

2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).

3. Enter **1** and press **ENTER** to access the zone programming.

4. Enter the zone number and press **ENTER** to access programming details and press **ENTER** again to move to between programming options.

Zone Assignments

All DGPs, zones (inputs) and relays (outputs) are numbered according to a set formula. This formula determines the number/location of DGPs, zones, and relays.

Zones and relays allocated to each DGP:

Control panel	1-16	DGP 8	129-144
DGP 1	17-32	DGP 9	145-160
DGP 2	33-48	DGP 10	161-176
DGP 3	49-64	DGP 11	177-192
DGP 4	65-80	DGP 12	193-208
DGP 5	81-96	DGP 13	209-224
DGP 6	97-112	DGP 14	225-240
DGP 7	113-128	DGP 15	241-255

Either 8 or 16 zones can be connected to the control panel to expand the control panel to 24 or 32 zones. A standard DGP has 4 or 8 zones, some can be expanded in increments of 8 to contain up to 32 zones. Expanding the number of zones connected to the control panel or a DGP to more than 16 zones by using the AL-1206 is the same as combining two DGP addresses. To maintain consistent numbering, the additional zones are taken from the next DGP address so you can not include the next DGP address for polling.

> *Example:* An AL-2017/AL-3017 control panel has one AL-1206 (8-zone input expander) connected to J7. There is also an AL-1205 (8-zone standard DGP) connected to the System bus. In this case the zone numbering, and DGP addressing, would be:

AL-2017/AL-3017 control panel	AL-1206 (standard zone expander)	AL-1205 (standard DGP)
Zones 1-16 allocated	Zones 17-32 allocated	Zones 33-48 allocated
for this address	for DGP 1 address	for DGP 2 address
	*unused zones must be disabled	*unused zones must be disabled

To program the system for this configuration:

1. Set the address DIP switch on the AL-1205 for DGP 2 (Refer to the AL-1205 Installation Instructions for further details).

2. In installer programming go to option 4, *(DGP Database).* Poll DGP 2 and set DGP Type to standard. **Do not** poll DGP 1 because the allocated zone inputs for DGP 1 have been taken by the AL-1206.

3. In installer programming go to option 1, *(Zone Database).* Select the proper zone type, area, and central station. Zone numbers 25-32 must be set for zone type *0 Disabled* as these zones are not used.

Communication options

Program communication options to set up the telephone numbers and communication formats for central station reporting. Reporting options can be set for both system and area reporting.

PBX number (public branched exchange)

Use this option when connection to the PSTN (public switch telephone network) is made via a PBX by dialing a number sequence. For example, you must dial 9 to get an ouside line. This feature should not be used if dial tone detection is required, as dial tone detection does not occur during this dial sequence. If dial tone detection is required, the PBX number can be entered in the central station phone number.

1. Press **MENU,** enter **1278,** and press **ENTER** to access system programming.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **9** and press **ENTER** to program communications options.
4. If a 2-second pause *P* is required prior to dialing, press **MENU, MENU**, enter the dialing sequence required to gain access to the outside telephone line, and press **ENTER**.
5. To clear a telephone number that has been previously entered, press **MENU, MENU**. A *P* will appear on the lower line of the keypad display and the previously entered telephone number will appear on the top line of the keypad display. Press **ENTER** and the telephone number will be cleared.

> **Note:** *Do not enter a "T" (wait for dial tone) since the dial tone detection does not occur during the PBX dialing string.*

MSN number (Microsoft Network)

For ISDN dialers, program a MSN number. This number is sent to the ISDN network on dialing, o a computer, or central station. To enter a MSN number, use the same method as used for the PBX number.

> **Note:** *The MSN number can not contain a 2-second dial pause "P" or wait for dial tone "T".*

Dial tone detection

This option enables or disables dial tone detection and also allows country specific dial tone detections. For operation in the USA, we recommend that *CTR21* be used. Dial tone detection will take place at the beginning of the central station dialing string when a *T* is detected in the dialing string. For example, in the number 9T1234567, dial tone detection will occur before the digit 9 is dialed and again before the 1 is dialed.

Enter the dial tone type to be detected:

> 0 = Disabled (no dial tone detection takes place, the panel will dial after a 2-second delay)
>
> 1 = CTR21
>
> 2 = Netherlands
>
> 3 = UK
>
> 4 = Other

New installer code

To delete, display, or create a user, do the following:

1. Press **MENU,** enter **1278,** and press **ENTER** to access system programming.
2. Enter **14** and press **ENTER** to access the users programming.
3. Enter **3** (create user) and press **ENTER.**
4. Enter **50** (Installer) and press **ENTER**.
5. Press **MENU** to list the available alarm groups that can be assigned.
6. Press **MENU** again to scroll through the list.
7. Press **ENTER** three times (to scroll through unneeded options) and press **MENU**.
8. Enter the new code (up to 10 digits) and press **ENTER**.
9. Press **ENTER** three times (to scroll through unneeded options).
10. Enter **0** and press **ENTER** to exit. The installer PIN code is now changed.

Relays (outputs)

Output controllers are used to expand the number of relays (outputs) on a DGP or control panel. Each output controller expands the outputs by eight. A DGP can have two output controllers connected, increasing the outputs to a maximum of 16 per DGP. An Alliance System can have up to 32 output controllers, which allows a system maximum of 255 outputs.

If there are more than two output controllers connected to the main control panel, resulting in more than 16 outputs, the output numbers are duplicated on DGP 1. When this is done, one of two options can be used:

    1. The outputs on DGP 1 are not used.

    or

    2. Both outputs are activated together.

    Example: If the main control panel has three output controllers and DGP 1 has one output controller, when output 17 is active, the first output on the third output controller connected to the control panel and the first output on the output controller that is connected to DGP 1 are both activated.

Output numbers are always the same as the first 16 zone numbers on the DGP they are connected to. If a DGP address does not exist because the previous DGP has an expanded number of zones, the output numbers of that DGP address cannot be used. The output numbers can be used if output controllers are connected to the control panel that corresponds to those output numbers.

Example:	DGP 1 has 32 zones:	17-48
	DGP 1 outputs (max 16):	17-32
	(DGP 2 outputs 33-48 are not used)	
	DGP 3 has 32 zones:	49-80
	DGP 3 outputs:	49-64
	(DGP 4 outputs 65-80 are not used)	

Strobe and siren outputs

The internal strobe output is always treated as output 2. The internal siren speaker output on the control panel is always treated as output 15 and the external siren speaker output on the control panel is always treated as output 16. On DGPs with siren speaker outputs, the last of the 16 output numbers associated with that DGP address is the siren output. For example, on DGP 3 the siren speader output is output 64.

DGP	Siren output number	DGP	Siren output number
DGP 1	32	DGP 9	160
DGP 2	48	DGP 10	176
DGP 3	64	DGP 11	192
DGP 4	80	DGP 12	208
DGP 5	96	DGP 13	224
DGP 6	112	DGP 14	240
DGP 7	128	DGP 15	-
DGP 8	144		

To enable the siren speaker output, the output number representing the siren output must be assigned to the required siren event flag number. The siren event flag numbers are programmed in installer programming option 2 (Area database).

Output control groups

Output control group numbers identify a group of eight outputs controlled by the control panel, a DGP, or a RAS. When an output control group is assigned to a RAS, the open collector output (OUT) terminal follows the first output of the output control group.

Programming steps

1. Press **MENU,** enter **1278,** and press **ENTER** to access system programming.
2. Enter **19** and press **ENTER** to access installer programming. Press **MENU** (advanced menu).
3. Enter **16** and press **ENTER** to access event to output programming.
4. Enter the output number to be programmed and press **ENTER**.
5. Enter the event flag number needed to trigger the output and press **ENTER**.
6. Enter the time zone assigned to the output and press **ENTER**.
7. Press **MENU** to toggle between *Output active* or *Inactive during time zone* and press **ENTER**.
8. Press **MENU** to toggle between *Output is inverted* or *Noninverted* and press **ENTER**.

Battery Capacity

The battery capacity calculations must be performed separately for each part of the system that has a separate AC supply and standby battery. Use the following steps to determine the correct battery capacities for your system:

1. Determine the exact configuration of your system.

2. A separate battery calculation worksheet should be used for each part of the system that has a separate power supply and standby battery. In the top row of the worksheet, list the primary component (control panel or expansion module) that is powered by the standby battery. Expansion modules include zone expander modules, relay modules, keypads and card readers.

3. On each worksheet, add rows for all expansion modules or other devices that are powered by the primary component on that worksheet.

4. On each worksheet, add rows for any type of notification appliance that is connected to corresponding circuits on the primary component. Also include rows for auxiliary power circuits that have attached devices.

Starting with the first worksheet:

5. On the row for the primary component, in the *total standby current* column, enter the current listed for that device. For the control panel worksheet, this value is 200mA.

6. On the same worksheet, in any following expansion module rows, enter the operating current for the module in the *standby current* column. On all of the expansion module rows, multiply the value in the *standby current* column by the attached quantity of modules of that type. Enter the result in the same row, in the *total standby current* column. If any row contains AL-1191 or AL-1193 card readers, enter 80mA in the *active current* column for that row. Multiply any value in the *active current* column by the number of attached card readers, and enter the result in the same row, in the *total active current* column.

7. On the same worksheet, in each notification appliance row, enter the alarm current drawn by a single device in the *alarm current per device* column. On all of the notification appliance rows multiply the value in the *alarm current per device* column by the number of devices used on that circuit. Enter the result in the same row, in the *total alarm current* column.

8. On the same worksheet, in rows listing devices that are attached to auxiliary power terminals of the primary component, enter the operating current for each device in the *standby current per device* column. On all of these rows, multiply the value in the *standby current per device* column by the number of devices attached to that auxiliary power circuit. Enter the result in the same row, in the *total standby current* column.

9. Repeat steps 5 through 8 for every worksheet.

10. At the bottom of each worksheet, total the values in the *total standby current* column, the *total alarm current* column, and the *total active current* column.

Perform the following calculations for each worksheet:

11. Transfer the totaled value at the bottom of the *total standby current* column to the first blank in formula 1. Enter the *required number of hours in standby* in the corresponding blank, and perform the indicated calculation. The result is the standby Amp-hours your system requires. The value for *required number of hours in standby* varies by locale. Check with the proper authority having jurisdiction to determine your requirements.

12. Transfer the totaled value at the bottom of the *total alarm current* column to the first blank in formula 2. Enter the *required number of minutes in alarm* in the corresponding blank, and perform the indicated calculation. The result is the alarm Amp-hours your system requires. The value for *required number of minutes in alarm* varies by locale. Check with the proper authority having jurisdiction to determine your requirements.

13. Transfer the totaled value at the bottom of the *total active current* column to the first blank in formula 3. To calculate the *required number of seconds active* value, multiply the number of times a card is typically passed by a card reader each hour times the number of card readers, times 5 seconds. For a medium traffic area, 12 accesses per hour is a commonly used value (i.e. 5 seconds per access).

14. Carry the calculated values from the preceeding three steps to the corresponding blanks in formula 4. Perform the calculation to find the minimum battery capacity requirement for your system.

15. Due to the natural aging effects on batteries over time, temperature cycles, and varying levels of discharge, a derating factor is applied to compensate for these variables. Please consult the battery manufacturer data sheets for the appropriate derating factor. Formula 5 shows how to apply a typical derating factor of 1.15 to the minimum battery capacity requirement to determine the actual battery capacity requirement. The batteries selected for the control panel and for any separately powered expansion modules, must have a capacity rating that is equal to or greater than the actual battery capacity requirement.

> **Note:** *This system may require two batteries. Each battery must individually meet the actual battery capacity requirement. Do not mix batteries of different types.*

Battery calculation worksheet example

1. _____225___mA X .001Amp/mA X _____72_____ hours: ___16.2_____ Ah standby Amp-hours

   Total standby current   *Conversion factor*   *Required number of hours in standby*

2. ___1000____mA X .001Amp/mA X _____15____ minutes X .0167 hours/min ___.2505_____ Ah alarm Amp-hours

   Total alarm current   *Conversion factor*   *Required number of minutes in alarm*   *Conversion factor*

3. ___80_____mA X .001Amp/mA X _____12960____ seconds X .000278 hours/sec ___.288_____ Ah active Amp-hours

   Total active current   *Conversion factor*   *Required number of seconds active*   *Conversion factor*

Note: *Based on 1 card activation of 15 seconds every 5 minutes for 72 hours.*

4. Standby Amp-hours + Alarm Amp-hours + Active Amp-hours = Minimum battery power required

   ___16.2_____ + ___.2505_____ + ___.288_____ = ___16.74_____Ah

5. Minimum battery power required X Battery capacity derating coefficient = Total standby battery required

   _____16.74_____ X _____1.15_____ = _____19.2_____Ah

Absolute maximum loads

The following tables list the maximum continuous loads that can be supported by two 17.2 Ah batteries or one 17.2 Ah battery. If the total standby current exceeds those listed in the tables, you do not meet 24/72-hour standby requirements. Other battery sizes are possible, but two 17.2 Ah batteries are the maximum battery size supported. If your standby time is different, the battery calculation worksheet can be used to calculate the total standby battery power required. If the answer exceeds the battery size you have chosen, then appropriate batteries must be installed or the system configuration must be adjusted to meet the battery power requirements.

Required batteries	Maximum continuous load for 24/72-hour standby with 15-minute alarm and 1 active card read/5 minutes			
	24-hour		72-hour	
	Maximum total	Maximum auxiliary plus system bus power	Maximum total	Maximum auxiliary
Two 17.2 Ah	750mA	500mA	325mA	100mA
	Maximum Total	Maximum auxiliary plus system bus power		
One 17.2 Ah	500mA	300mA	_	_

Battery calculation worksheet

Alliance components	Standby current	Total standby current	Alarm current per device	Total alarm current	Active current	Total active current
AL-2017		200mA				
Aux power		300mA				
Ext siren			1000mA			
Int siren			1000mA			
Strobe			1000mA			
AL-3017		200mA				
Aux power		300mA				
Ext siren			1000mA			
Int siren			1000mA			
Strobe			1000mA			
Comms bus		1000mA				
AL-11XX	120mA					
AL-1170	45mA					
AL-1191	25mA				80mA	
AL-1193	25mA				80mA	
AL-1205		75mA				
Aux power		250mA				
Siren			1000mA			
AL-1206	25mA					
AL-1210	53mA					
AL-1220	53mA					
AL-1255/56/65		275mA				
Aux power		1000mA				
Siren			1000mA			
AL-1801	80mA					
AL-1810	100mA					
AL-1811	200mA					
AL-1830	5mA					
AL-1832	15mA					
Total current requirements						

Calculations:

1. _____mA X .001Amp/mA X _____ hours: _____ Ah standby Amp-hours

   Total standby current   *Conversion factor*   *Required number of hours in standby*

2. _____mA X .001Amp/mA X _____ minutes X .0167 hours/min _____ Ah alarm Amp-hours

   Total alarm current   *Conversion factor*   *Required number of minutes in alarm*   *Conversion factor*

3. _____mA X .001Amp/mA X _____ seconds X .000278 hours/sec _____ Ah Active Amp-Hours

   Total active current   *Conversion factor*   *Required number of seconds active*   *Conversion factor*

4. Standby Amp-hours + Alarm Amp-hours + Active Amp-hours = Minimum battery power required

   _____ + _____ + _____ = _____Ah

5. Minimum battery power required X Battery capacity derating coefficient = Total standby battery required

   _____ X _____1.15_____ = _____Ah

FCC Compliance

Part 15 notification

This device complies with part 15 of the FCC rules. Operation is subject to the following three conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

(3) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

> **Note** *In order to maintain compliance with FCC Class B rules, shielded cable must be used (Belden 8723 or equivalent).*

Part 68 notification

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the inside of the door of the enclosure of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. the digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service my be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be adviced of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact GE Interlogix technical support at 800 648-7424. If the equipment is causing harm to the telephone network, the telphone company may request that you disconnect the equipment until the problem is solved.

This equipment must have the ability to seize the line in the event of an emergency. Do not connect this equipment to a party line service as line seizure is not possible.

Automatic dialers

> **When programming emergency numbers and (or) making test call to emergency numbers:**
> 1. **Remain on the line and briefly explain to the dispatcher the reason for the call.**
> 2. **Perform such activities in the off-peak hours, such as early morning or late evenings.**

UL Compliance Statement

UL Listings

UL 264, Standard for Access Control System Units

UL 365, Standard for Police Station Connected Burglar Alarm Units and Systems

UL 609, Standard for Local Burglar Alarm Units and Systems

UL 1610, Standard for Central-Station Burglar-Alarm Units

UL 1635, Standard for Digital Alarm Communicator System Units

To maintain compliance with UL365, UL609, and UL1610:

Mercantile Premises Alarm Systems

1. Zone types 22, 28, 29, and 30 (Auto Reset) can not be used.
2. Force arming is not allowed (see the *Alliance System Programming Manual*).
3. Siren time should be programmed for no less than 15 minutes (see the *Alliance System Programming Manual).*
4. Siren delay time must be set to 0 seconds (see the *Alliance System Programming Manual*).
5. Total combined entry/exit time can not exceed 60 seconds (see the *Alliance System Programming Manual).*

6. Alarm sounding device must be powered by the control unit and the siren test must be programmed "YES" (see the *Alliance System Programming Manual*).

7. Safe and vault supervision circuits must be programmed for 24-hour operation (see the *Alliance System Programming Manual).*

8. The system must be programmed for 24-hour test reports to be sent to the control station (see the *Alliance System Programming Manual*).

9. Dual zone operation is not permitted.

10. Reporting to central station 2, 3, and 4 must be set to "NO" (see the *Alliance System Programming Manual).*

11. Display shunted zones on LCD keypad must be set to "YES" (see the *Alliance System Programming Manual).*

12. Resets from RAS without code must be set to "NO" (see the *Alliance System Programming Manual*).

13. AC fail delay time must not exceed 240 minutes (see the *Alliance System Programming Manual*).

14. System tamper activates siren and strobe must be set to "YES" (see the *Alliance System Programming Manual).*

15. Latching system alarms must be set to "YES" (see the *Alliance System Programming Manual*).

16. Siren types must be set to "1" (see the *Alliance System Programming Manual*).

17. Enable PSTN line monitor must be set to "YES" (see the *Alliance System Programming Manual*).

18. Sirens only after fail to report must be set to "NO" (see the *Alliance System Programming Manual*).

Mercantile safe and vault

In addition to the above requirements, Mercantile Safe and Vault Alarm Systems must comply with the following:

1. Alarm sounding device output must be mechanically and electrically protected (see hook-up label).

Bank safe and vault

In addition to the above requirements, Bank Safe and Vault Alarm Systems must comply with the following:

1. This equipment must be installed within a complete vault, a complete safe, or an extent number 1 stockroom.

2. The system must be programmed to inhibit disarming the system during closed hours (see the *Alliance System Programming Manual*).

   Note: *For Bank Safe and Vault applications, both the internal and external alarm sounding devices must be the UL Listed Ademco, Model AB12M.*
   For Mercantile Premise and Mercantile Safe and Vault applications, the alarm sounding devices must be a UL Listed Burglar Alarm bell or siren such as the Moose, Model MPI35.

   Note: *The maximum AUX Power output including comms bus power (max total):*

	24-Hour	*72-Hour*
AL-2017	*500mA*	*100mA*
AL-3017	*500mA*	*100mA*

Specifications

Control panel (no accessories) specifications

Current consumption	200 mA nominal
End-of-line (EOL) resistors	10.0 kΩ, 5%, 0.25W
	4.7 kΩ, 5 %, 0.25W
	2.0 kΩ, 5%, 0.25W
Enclosure dimensions (L x W x D)	21" (533mm) x 14.5" (368mm) x 4.5" (114mm)
Operating temperature	32 °F to 122 °F (0 °C to 50 °C)
Humidity	95% non-condensing
Listings	UL 294 - the Standard for Access Control System Units
	UL 365 - the Standard for Police Station Connected Burglar Alarm Units and Systems
	UL 609 - the Standard for Local Burglar Alarm Units and Systems
	UL 1610 - the Standard for Central-Station Burglar-Alarm Units
	UL 1635 - the Standard for Digital Alarm Communictor System Units

Note: *Do not mix EOLs on the same panel.*

External terminals specifications

Part	Terminal	Description	Min	Typ	Max	
J17	AC	Input	16.5*	24**		VAC
					2.1	A
	BATT	Battery connection	9	12	14	VDC
		Battery charge			1	A
		Battery AH rating			24	AH
J14, J10	AUX.POWER	Auxiliary power output	9	13.8	14	VDC
	COMMS	System bus power output			300	mA
J13	EXT SIREN	Alarm outputs	9	13.8	14	VDC

* AL-1692   ** AL-1690, AL-1691

Values for end-of-line resistors

The following list contains the values to be used for EOL resistors. Both the resistance and the voltage over the zone are shown. The voltage will differ for other power supply voltages measured.

To get the current power supply voltage, measure the voltage over the zone when it is open. The EOL resistor used is based on the setting for the EOL resistor code as programmed in the system options (see the *Alliance System Programming Manual*).

EOL code 0 (10 kOhm resistors)

Status	Rzone (kOhms)	Vzone (V)
Active zone	6.4	8.01 - 0
Normal zone	7.1 - 14.2	8.34 - 10.42
Active zone	>18.1	11.01 - 13.8

EOL code 1 (4.7 kOhm resistors)

Status	Rzone (kOhms)	Vzone (V)
Active zone	1.02 < 2.4	4.69 - 0
Normal zone	3.3 - 5.2	5.72 - 7.28
Active zone	>7.2	8.34 - 13.8

EOL code 2 (2 kOhm resistors)

Status	Rzone (kOhms)	Vzone (V)
Active zone	1.5	3.4 - 0
Normal zone	3.0 - 1.6	3.5 - 5.1
Active zone	3.1	5.5 - 13.8